

CLAIMS

1. A two-dimensional modulation method for hologram recording for generating coherent light containing therein page data through spatial light modulator having a plurality of pixels two-dimensionally arranged therein,

wherein said pixels of said spatial light modulator are partitioned into a plurality of blocks consisting of  $m$  pixels (where  $m =$  an integral number) adjacent to each other, and a boundary portion which has a width having at least the width of one pixel in said spatial light modulator or of one pixel of an image detecting sensor used to reproduce the recorded page data and the distance between the adjacent pixels in each of said blocks, and which shields light is provided between the adjacent blocks.

2. The two-dimensional modulation method for hologram recording according to claim 1, comprising the steps of:

grouping data to be recorded into blocks per  $n$  bits (where  $n < m$ , and  $n =$  an integral number);

generating page data by carrying out the two-dimensional modulation for allocating  $m$  bit data to each block, per  $n$  bits, which is obtained by the grouping by referring to a modulation table; and

driving said spatial light modulator according to the resulting page data;

wherein in said step of generating page data, boundary data for said boundary portion is added to each of said blocks.

3. The two-dimensional modulation method for hologram

recording according to claim 2, further comprising the step of:  
generating page data for a boundary with which said boundary  
is provided,

wherein said page data for the boundary and  
two-dimensionally modulated data are superimposed on each other  
in order to drive said spatial light modulator.

4. The two-dimensional modulation method for hologram  
recording according to claim 1, wherein each of said pixels of  
said spatial light modulator is constituted by a plurality of  
sub-pixels, and for the pixel which should shield light, all the  
sub-pixels of the pixel concerned are made in a light shielding  
state, and for the pixel which should transmit light, a part of  
the sub-pixels of the pixel concerned is made in a light shielding  
state, and the remaining sub-pixels are made in a light transmitting  
state, and when the pixel which should transmit light is adjacent  
to said adjacent blocks, said sub-pixels of the pixel concerned  
in the light shielding state are arranged between the adjacent  
blocks so as to constitute a part of said boundary portion.

5. A hologram apparatus provided with a spatial light  
modulator having a plurality of pixels two-dimensionally arranged  
therein and irradiating coherent light containing therein page  
data to be recorded on a hologram recording carrier through said  
spatial light modulator to record information with an optical  
interference pattern generated by the coherent light as a  
diffraction grating,

wherein said spatial light modulator comprises a plurality  
of blocks consisting of  $m$  pixels (where  $m =$  an integral number)

adjacent to each other, and a boundary portion which is provided between the adjacent blocks and has a width having at least the width of one pixel of said spatial light modulator or of one pixel of an image detecting sensor used to reproduce the recorded page data and the distance between the adjacent pixels in each of said blocks, and which shield light.

6. The hologram apparatus according to claim 5, further comprising a boundary generating portion for driving said spatial light modulator so as to display a plurality of continuous pixels in a light shielding state as said boundary portion.

7. The hologram apparatus according to claim 6, wherein said boundary generating portion groups data to be recorded into blocks per n bits (where  $n < m$ , and  $n =$  an integral number); generates page data by carrying out two-dimensional modulation for allocating  $m$  bit data to each block per  $n$  bits by referring to a modulation table; drives said spatial light modulator according to the resulting page data; and adds boundary portion data for said boundary portion to each of said blocks when generating the page data.

8. The hologram apparatus according to claim 7, wherein said boundary generating portion generates page data for a boundary portion with which said boundary portion is provided, and drives said spatial light modulator so that the page data for a boundary portion and two-dimensionally modulated data are superimposed on each other.

9. The hologram apparatus according to claim 6, wherein said boundary generating portion drives said spatial light

modulator so that each of said pixels of said spatial light modulator is constituted by a plurality of sub-pixels, and for the pixel which should shield light, all the sub-pixels of the pixel concerned are made in a light shielding state, and for the pixel which should transmit light, a part of the sub-pixels of the pixel concerned is made in a light shielding state, and the remaining sub-pixels are made in a light transmitting state, and when the pixel which should transmit light is adjacent to said adjacent blocks, said sub-pixels of the pixel concerned in the light shielding state are arranged between the adjacent blocks so as to constitute a part of said boundary portion.

10. The hologram apparatus according to claim 5, wherein said boundary portion is formed in advance as a light shielding portion of said spatial light modulator.

11. The hologram apparatus according to claim 10, wherein at least a part of a driving circuit of said spatial light modulator is disposed in said light shielding portion, which is formed in advance, of said spatial light modulator.